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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/589,390

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Shigeki Imai

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EXAMINER

DANG, PHUC T

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/589,390	Applicant(s) IMAI ET AL.	
	Examiner Phuc T. Dang	Art Unit 2892	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on RCE filed on 01/07/2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 4-7,9-18 and 20-22 is/are pending in the application.
- 4a) Of the above claim(s) 23-34 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 6,7,9,10,13-15,17,18 and 20-22 is/are allowed.
- 6) ☒ Claim(s) 4,5,11,12 and 16 is/are rejected.
- 7) ☒ Claim(s) 16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>01/07/2009</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This application is a 371 of PCT/JP05/02352 filed on February 16, 2005.

Request for Continued Examination (RCE)

2. Request for Continued Examination (RCE) filed on January 7, 2009 has been acknowledged and considered.

In Request for Continued Examination (RCE), Applicants canceled claims 1-3, 8 and 19 and withdrawn claims 23-34.

Claims 1-3, 8, 19 and 23-34 are currently still pending in the application.

Information Disclosure Statement

3. The office acknowledges receipt of the following items from the applicant:

Information Disclosure Statement (IDS) filed on January 7, 2009.

Claim Objection

4. Claim 16 is objected to because of the following:

In claim 16, line 2, delete “(s)” after -- ...chemical oxide film --.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 4-5 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gutsche et al., hereafter “Gutsche” (U.S. Publication No. 2003/0114018 A1) in view of Rodrigo et al., hereafter “Rodrigo” (U.S. Patent No. 4,064,221).

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Regarding claims 4 and 11, Gutsche disclose a method of manufacturing a thin film transistor including an oxide film, the method comprising an oxide film forming step comprising:

immersing a substrate in an oxidizing solution containing an active oxidizing species for direct oxidation of the substrate to form a chemical oxide film at a temperature of 200°C or lower temperature, the substrate having a surface on which a chemical oxide film is to be formed,

the substrate being immersed in the oxidizing solution of different concentrations (see claim 11 of Gutsche's reference).

Gutsche discloses the features of the claimed invention as discussed above, but does not disclose the concentration of the oxidizing solution being altered from a low-concentration oxidizing solution to a high-concentration oxidizing solution and the low-concentration oxidizing solution has a lower concentration than an azeotropic concentration; and the high-concentration oxidizing solution has a concentration more than or equal to the azeotropic concentration.

However, Rodrigo, in the same field of endeavor, discloses the concentration of the oxidizing solution being altered from a low-concentration oxidizing solution to a high-concentration oxidizing solution and the low-concentration oxidizing solution has a lower concentration than an azeotropic concentration; and the high-concentration oxidizing solution has a concentration more than or equal to the azeotropic concentration (see col. 1, lines 8-20 and col. 4, lines 9-14).

It would have been obvious to one having ordinary skilled in the art at the time the invention was made to modify the teaching of Gutsche to form the concentration of the oxidizing solution

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being altered from a low-concentration oxidizing solution to a high-concentration oxidizing solution and the low-concentration oxidizing solution has a lower concentration than an azeotropic concentration; and the high-concentration oxidizing solution has a concentration has a concentration more than or equal to the azeotropic concentration as taught by Rodrigo for a purpose of reducing the energy consumption of the compressor.

Regarding claim 5, claim 5 is rejected similar to claim 4 above except for in the oxide film forming step, the low-concentration oxidizing solution is concentrated to prepare the high-concentration oxidizing solution.

However, it would have been an obvious matter of design choice to form the oxide film wherein the low-concentration oxidizing solution is concentrated to prepare the high-concentration oxidizing solution, since applicant has not disclosed the above limitation solves any stated problem or for any particular purpose, then, the process of Gutsche and Rodrigo can perform equally with the technique of the claimed invention.

6. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gutsche and Rodrigo in view of Yamaguchi (U.S. Publication No. 2005/0136658 A1).

Regarding claim 12, Gutsche and Rodrigo disclose the features of the claimed invention as discussed above, but do not disclose further comprising, after forming the chemical oxide film, a step of forming an insulating film on the chemical oxide film.

Yamaguchi, however, in the same field of endeavor, discloses further comprising, after forming the chemical oxide film, a step of forming an insulating film 4 on the chemical oxide film 3 (see para [0034]).

It would have been obvious to one having ordinary skilled in the art at the time the invention was made to modify the teaching of Gutsche and Rodrigo to form an insulating film on the chemical oxide film after forming the chemical oxide film as taught by Yamaguchi for a purpose of reducing suppression of crystallization on the substrate.

7. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gutsche and Rodrigo in view of Nakada et al., hereafter "Nakada" (U.S. Publication No. 2004/0053516 A1).

Regarding claim 16, Gutsche and Rodrigo disclose the features of the claimed invention as discussed above, but do not disclose further comprising, after the oxide film forming step, the step of subjecting the chemical oxide film to nitriding.

Yamaguchi, however, in the same field of endeavor, discloses further comprising, after the oxide film forming step, the step of subjecting the chemical oxide film to nitriding (see para [0069]).

It would have been obvious to one having ordinary skilled in the art at the time the invention was made to modify the teaching of Gutsche and Rodrigo to form the step of subjecting the chemical oxide film to nitriding after forming the chemical oxide film as taught by Yamaguchi for a purpose of controlling the amount of nitrogen.

Allowable Subject Matter

8. Claims 6-7, 9-10, 13-15, 17-18 and 20-22 would be allowed.

The following is a statement of reason for the indication of allowable subject matter:

Claims 6-7, 9-10, 13-15, 17-18 and 20-22 are considered allowable since the prior art of record and the considered pertinent to the applicant's disclosure does not teach or suggest the claimed invention having the substrate on which the chemical oxide film is to be formed contains, on the surface, at least one component selected from the group consisting of

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monocrystal silicon, polycrystalline silicon, amorphous silicon, continuous grain silicon, silicon carbide, and silicon germanium as cited in claim 7 and wherein the oxidizing solution is an azeotropic mixture containing at least one solution selected from the group consisting of nitric acid, perchloric acid, sulfuric acid, ozone- dissolving water, aqueous hydrogen peroxide, a mixed solution of hydrochloric acid and aqueous hydrogen peroxide, a mixed solution of sulfuric acid and aqueous hydrogen peroxide, a mixed solution of aqueous ammonia and aqueous hydrogen peroxide, a mixed solution of sulfuric acid and nitric acid, aqua regia, and boiling water; a gas thereof; or a mixed solution thereof as cited in claim 9 and concentrating the oxidizing solution below azeotropic concentration up to or in excess of an azeotropic concentration with the substrate being immersed in that oxidizing solution to form a second oxide film on the first oxide film as cited in claim 13.

Claims 6, 14, 17-18 and 20-22 depend on claim 7 and claims 10 and 15 depend on claim 9.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Muraoka (U.S. Patent No. 6,896,927 B2) and Matsunaga et al (U.S. Publication No. 2004/0224866 A1).

10. Applicants are advise to cancel the non-elected claims 23-34 upon response to the next Office action if the application is considered to be allowed.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phuc T. Dang whose telephone number is 571-272-1776. The examiner can normally be reached on 8:00 am-5:00 pm.

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12. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thao X. Le can be reached on (571) 272-1708. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular communications and Final communications.

13. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

/Phuc T Dang/

Primary Examiner, Art Unit 2892